b- $B = \frac{1}{LC} \Leftrightarrow CL = \frac{1}{B} \Rightarrow L = \frac{1}{BC}$

$$L = \frac{1}{BC} = \frac{1}{2,47.10^6.15.10^{-6}} = \frac{1}{37,05} = 2,7.10^{-2}\,H$$

$$A = \frac{r}{L} \Rightarrow r = AL \Rightarrow r = 2,7.10^{-2} \times 444 = 12\Omega$$

7) $$\frac{dE_t}{dt} = \frac{d\left(\frac{1}{2}C.u_C^2 + \frac{1}{2}L.i^2\right)}{dt}$$

$$= \frac{1}{2}.2.C.u_C.\frac{du_c}{dt} + \frac{1}{2}.2.L.i.\frac{di}{dt}$$

$$= C.u_C.\frac{du_c}{dt} + L.i.\frac{di}{dt}$$

$$= i\left[u_C + L\frac{di}{dt}\right] = -r\,i^2 < 0$$

⇨ L'énergie totale diminue au cours de temps.

$\Delta E_T = E_{T_2} - E_{T_1}$ à $t = t_2 \Rightarrow U_C = 0$

$$\Delta E = \left(\frac{1}{2}C.u_C^2 + \frac{1}{2}L.i^2\right)_{t_2} - \left(\frac{1}{2}C.u_C^2 + \frac{1}{2}L.i^2\right)_{t_1}$$

$$\Delta E = \frac{1}{2}L.i^2 - \frac{1}{2}C.u_C^2$$

$$\Delta E = \frac{1}{2} \times 2,7.10^{-2} \times (0,17)^2 - \frac{1}{2} \times 15.10^{-6} \times 9^2$$

$$\Delta E = 3,9.10^{-4} - 6,075.10^{-4} = -2,17.10^{-4}\,J$$

PARTIE 3 :

1) $\omega_0 = \frac{1}{\sqrt{L.C}} = 1571\ rad.s^{-1}$

$T_0 = 2\pi\sqrt{L.C} = 4.10^{-3}\ s$

2) $I_m = \omega_0 Q_m = \omega_0 C.U_m$

AN : $I_m = 0,28\ A$

3) $u_c(t) = U_m \sin(\omega_0 t + \varphi)$

$$\frac{u_C}{U_m} = \sin(\omega_0 t + \varphi) \quad ①$$